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Comments: Chances as Protected Interests: Recovery for the Loss of a Chance and Increased Risk

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CHANCES AS PROTECTED INTERESTS: RECOVERY FOR THE LOSS OF A CHANCE AND INCREASED RISK

Two closely related tort concepts, loss of chance and increased risk, have gained increasing, but not general, acceptance by courts. The loss of a chance of avoiding injury or disease and the increased risk of injury or disease are measureable injuries caused by negligent conduct. Loss of chance cases typically arise in the context of medical malpractice; increased risk cases often arise when a plaintiff has been negligently exposed to an element which makes him susceptible to a particular disease. This comment examines the treatment that courts have given loss of chance and increased risk cases. The author concludes that courts should recognize chances as protected interests and permit recovery for loss of chance and increased risk.

I. INTRODUCTION

The tort concept of "loss of chance" is unsettled, misunderstood and misconceptualized.[1] A loss of chance exists where the defendant's conduct has caused the plaintiff to lose a chance of avoiding some physical injury or disease.[2] Many American courts have traditionally recognized only manifested physical injuries, and not chances, as compensable interests.[3] Consequently, courts have failed to conceptualize the relationship between causation and damage when the damage is the loss of a chance. This confusion has resulted in judicial distortion of the traditional standard for proving proximate cause in loss of chance cases.[4] In many cases, unjust summary dispositions result even though a plaintiff has incurred statistically measureable damages due to the negligent conduct of the defendant.[5]

Some courts, however, do recognize a cause of action for the loss of a chance.[6] These courts recognize that the loss of a chance of avoiding some physical injury or disease is an injury which is separate and distinct from the manifested injury or disease. Recovery is permitted for the reduction in chance of avoiding the physical injury or disease which was caused by the defendant's negligence.[7] A typical loss of chance scenario

1. *See generally* King, *Causation, Valuation, and Chance in Personal Injury Torts Involving Preexisting Conditions and Future Consequences*, 90 YALE L.J. 1353 (1981).
2. *See* Comment, *Proving Causation in "Loss of a Chance" Cases: A Proportional Approach*, 34 CATH. U.L. REV. 747, 749 (1985) [hereinafter Comment, *Proving Causation*].
3. *See* Comment, *Medical Malpractice: The Right to Recover for the Loss of a Chance of Survival*, 12 PEPPERDINE L. REV. 973, 978 (1985) [hereinafter Comment, *The Right to Recover*]; *see also infra* notes 35-63 and accompanying text.
4. *See infra* notes 35-45 and accompanying text.
5. *See infra* notes 28-30, 46-63 and accompanying text. These results most often occur where, prior to the defendant's negligent act, the plaintiff had a less-than-even chance of avoiding injury or harm. *See generally* King, *supra* note 1.
6. *See infra* notes 67-79 and accompanying text.
7. *See infra* notes 67-79 and accompanying text.

arises when a doctor negligently misdiagnoses or fails to diagnose a disease. For example, assume that at the time of a negligent misdiagnosis a cancer patient had a forty percent chance of survival.[8] Because of the negligent misdiagnosis, the patient receives no medical treatment. Upon a subsequent diagnosis of cancer, the patient's chance of survival has been reduced to twenty percent because of the delay in treatment. Thereafter the patient, unresponsive to the delayed treatment, dies. The widow of the patient brings a negligence action against the doctor.[9] A court permitting recovery for the loss of a chance will award damages for the loss of a twenty percent chance of survival.

This comment begins by tracing the development of chance recovery in contract law. It then analyzes the improper treatment accorded loss of chance by courts that use the chance in their determination of proximate cause, and how this treatment has distorted the traditional standard for proving proximate cause. Next, the comment discusses decisions which recognized chances as protected interests and permitted recovery for loss of chance. Also, it discusses a related area of tort, increased risk of injury or disease. Next, computational models for valuing damages in loss of chance and increased risk cases are discussed. This comment recommends how the Maryland courts should approach both loss of chance and increased risk cases. Finally, this comment concludes by asserting that courts should acknowledge that chances are protected interests and should refrain from distorting the proximate cause standard.

II. CHANCE RECOVERY AND THE DISTORTION OF THE STANDARD FOR PROVING PROXIMATE CAUSE

A. Derivation of Chance Recovery from Contract Law

Recovery for loss of chance in tort has its roots in contract law.[10] The theory for recovery was established under English common law, where courts permitted recovery by plaintiffs who lost a less-than-even

8. "Cancer statistics are based on various 'survival rates,' which represent the length of time victims have survived after a given date, whether it be the date of diagnosis or of the beginning of treatment." Comment, *Proving Causation*, *supra* note 2, at 749 n.24 (citing American Joint Committee on Cancer, MANUAL FOR STAGING OF CANCER, at 11 (2d ed. 1983)).

9. In order to prevail in a negligence action, the plaintiff must establish: (1) that the defendant had a duty, or obligation, recognized by law to protect the plaintiff from some risk; (2) the defendant breached that duty; (3) there existed a close causal connection between the conduct and the resulting injury; and (4) the plaintiff suffered actual loss or damages. W. PROSSER & W. KEETON, THE LAW OF TORTS, § 30, at 164-65 (5th ed. 1984). The third and fourth elements have been the object of distress and confusion among courts in loss of chance cases. For the purposes of this comment it will be assumed that the first and second elements may be or have been established by the plaintiff.

10. *See* Cooper, *Assessing Possibilities in Damages Awards - The Loss of a Chance or the Chance of a Loss*, 37 SASK. L. REV. 193, 197-209 (1975); King, *supra* note 1, at 1378-79.

chance of obtaining a favorable contractual result, such as profits.[11] Damages were awarded on a "pro-rata" basis, whereby the plaintiff received an award reflecting the percentage probability that the defendant had diminished the likelihood of achieving the favorable outcome.[12] American courts, at first hesitant to recognize chances as protected interests,[13] followed English cases and permitted pro-rata recovery in contract disputes.[14] Recognition of chances as protected interests in tort, however, has not gained general acceptance.[15]

B. Recovery for the Loss of a Chance in Tort: The Distortion of the Standard for Proving Proximate Cause

Many American courts have failed to recognize the injury sought to be redressed in loss of chance cases in which the plaintiff had a less-than-even chance of avoiding injury or disease.[16] Some courts, failing to recognize that the loss of a chance should be a compensable interest, have applied the loss to their determination of the proximate cause of the man-

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11. *Id.*; *see also* Schaefer, *Uncertainty and the Law of Damages*, 19 WM. & MARY L. REV. 719, 754-59 (1978).

    In *Chaplin v. Hicks*, 2 K.B. 786 (C.A. 1911), the plaintiff was one of fifty semi-finalists in a beauty contest. *Id.* at 787. Twelve out of the fifty were to be awarded acting contracts. *Id.* at 786. The defendant failed to notify the plaintiff of her selection as a semi-finalist, causing her to miss the final evaluation round. *Id.* at 788.

    The plaintiff brought suit for breach of contract. *Id.* The jury determined that the value of the lost chance was £100. *Id.* The lower court's judgment was affirmed by the Court of Appeal, which recognized that the plaintiff was not suing for the value of the acting contract, but the value of a chance to win the contract. *Id. passim.* The court held that such a chance is a compensable interest. *Id.* at 793. Further, the court noted that difficulty in assessing or computing damages should not bar recovery. *Id.* at 791; *see also* Davies v. Taylor, 3 All E.R. 836 (H.L. 1972).
12. Cooper, *supra* note 10, at 197-209; Note, *Damages Contingent Upon Chance*, 18 RUTGERS L. REV. 875, 885-92 (1964) [hereinafter Note, *Damages Contingent*].
13. *See, e.g.*, Western Union Tel. Co. v. Hall, 124 U.S. 444 (1888) (no damages for lost chance of future profits when plaintiff could not prove to a certainty he would have made such profits); Collatz v. Fox Wis. Amusement Corp., 239 Wis. 156, 300 N.W. 162 (1941) (no damages for plaintiff who was wrongly eliminated from contest when he could not prove he would have won the contest). *See generally* Cooper, *supra* note 10, at 209-15; Note, *Damages Contingent*, *supra* note 12, at 885-92.

    Early commentators asserted that the loss of a chance should be compensable. *See* C. MCCORMICK, DAMAGES, § 31, at 117-23 (1935); Malone, *Ruminations on Cause-in-Fact*, 9 STAN. L. REV. 60, 80 (1956); Schaefer, *supra* note 11, at 762; Note and Comment, *The Rule of Certainty and the Value of a Chance*, 10 MICH. L. REV. 392 (1911).
14. *See, e.g.*, Mange v. Unicorn Press, Inc., 129 F. Supp. 727 (S.D.N.Y. 1955) (recovery for lost chance to win a contest); Wachtel v. National Alfalfa Journal Co., 190 Iowa 1293, 176 N.W. 801 (1920) (contestant in a magazine contest recovered damages for lost chance to win the contest when the contest was discontinued in her "district"); Hall v. Nassau Consumers' Ice Co., 260 N.Y. 417, 183 N.E. 903 (1933) (recovery for the lost chance of a $5,000 bond payment); Kansas City, M. & O. Ry. v. Bell, 197 S.W. 322 (Tex. Civ. App. 1917) (recovery of damages for lost chance of winning prize money caused by delay of shipper in transporting hogs to a stock show).
15. *See infra* notes 35-63 and accompanying text.
16. *See infra* notes 35-63 and accompanying text.

ifested physical injury or disease.[17] This treatment has led to the distortion of the standard for proving proximate cause[18] and the inappropriate compensation of plaintiffs.[19]

1. The Preponderance Standard

The concept of proximate cause[20] limits the liability of any defendant whose conduct, while a cause-in-fact of the plaintiff's injury, was so remotely related to the injury that the law prescribes that he cannot be held accountable for the injury.[21] Proximate cause requires there to be some reasonable connection between the act of the defendant and the injury suffered by the plaintiff.[22] Generally, a tort plaintiff must establish causation by a preponderance of the evidence.[23]

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17. *See infra* notes 35-45 and accompanying text. The manifested physical injury or disease results when the plaintiff's chance of avoiding injury or disease is reduced to zero. For example, the manifested injury in the scenario in the Introduction is death. Similarly, where a plaintiff suffers an increased risk of cancer, the manifesting disease is cancer. The increased risk of cancer is the compensable injury presently suffered by the plaintiff. *See also infra* text and accompanying notes 90-111.
18. *See infra* notes 35-45 and accompanying text.
19. *See infra* notes 25-30 and accompanying text.
20. According to Dean Prosser, proximate literally means near or immediate, however, he asserts that those definitions are confusing because they emphasize physical or mechanical closeness. For this reason, Prosser advocates that legal or responsible cause would be more accurate terminology. W. PROSSER & W. KEETON, *supra* note 9, § 42, at 273.
21. *Id.* § 41, at 264. Such limitations are necessary, for in a philosophical sense, a harm could be traced back eternally to its source. Similarly, the consequences of any act may set forces in motion with far-reaching results. *Id. See generally* Malone, *supra* note 13.
22. W. PROSSER & W. KEETON, *supra* note 9, § 41, at 264; *see also* RESTATEMENT (SECOND) OF TORTS §§ 430-431 (1965). The Restatement provides that the following constitute legal cause: (1) conduct which is a substantial factor in bringing about the harm and (2) those circumstances when "there is no rule of law relieving the actor from liability because of the manner in which his negligence has resulted in the harm." *Id.* § 431. Moreover, the determination of proximate cause is subject to basic considerations of fairness and social policy. *See, e.g.*, Scott v. Watson, 278 Md. 160, 171, 359 A.2d 548, 555 (1976) (landlord has a duty to keep common areas of apartment building safe); Peterson v. Underwood, 258 Md. 9, 16, 264 A.2d 851, 855 (1970) (builder of wall not liable where wall collapsed, killing a child, four and one-half years after the wall was erected).
23. Robin Express Transfer, Inc. v. Canton R.R. Co., 26 Md. App. 321, 334-35, 338 A.2d 335, 343 (1975); *see also* W. PROSSER & W. KEETON, *supra* note 9, § 41, at 269 (plaintiff must establish that it is more likely than not that the defendant caused his injury). The preponderance standard is one of three standards of proof used by courts. The substantial possibility standard permits recovery "for a loss even when there was proof of only a substantial possibility that the [injury] would have been avoided but for the tortious conduct." King, *supra* note 1, at 1368.

A third standard for proving causation, the actual certainty standard, is the least prevalent standard for proving causation, because "the very idea of certainty of unknown and future events is implausible." *Id.* at 1367; *see also* RESTATEMENT (SECOND) OF TORTS § 433B comment b (1965) (causation is incapable of mathematical proof; one cannot say with absolute certainty what would have happened had the defendant not acted otherwise).

To meet the preponderance standard in a jurisdiction which does not recognize chances as protected interests, a plaintiff must establish that there existed a better-than-even chance of avoiding physical injury or disease.[24] A plaintiff meeting this standard will be compensated, not for the lost chance, but only for the particular physical injury suffered.[25] Frequently, this standard for recovery causes overcompensation of plaintiffs.[26] For example, the plaintiff in a survivorship action in which the decedent had a fifty-one percent chance of survival will receive one hundred percent of the value of the survivorship claim if he proves the defendant's negligence. Thus, if the plaintiff proves causation by a preponderance of the evidence, but not to a certainty, he will receive complete satisfaction for the resulting injury. Recovery will not be discounted by the probability that the death may have occurred notwithstanding the defendant's conduct.[27]

Summary judgment for the defendant results, however, where the plaintiff had a less-than-even chance of avoiding injury or disease.[28] Under such circumstances the plaintiff will receive no compensation from the defendant.[29] Thus, for example, a plaintiff whose decedent had a forty-nine percent or less chance of survival prior to defendant's negligent act will not recover any damages in a survivorship action.[30]

The preceding are illustrative of the unjust results stemming from the refusal of many courts to recognize chances as protected interests and the application of the "all-or-nothing" rule when assessing damages in loss of chance cases.[31] Because medicine is not an exact science, many loss of chance cases become a "battle of the experts" in which the liti-

24. Otherwise, it is not "more likely than not" that the defendant caused the plaintiff's injury. *See* King, *supra* note 1, at 1365-70.
25. *See id.* at 1365.
26. *Id.*
27. *Id.*; *see also* Herskovits v. Group Health Coop., 99 Wash. 2d 609, 632-34, 664 P.2d 474, 486-87 (1983) (en banc) (Pearson, J., concurring) (advocating the adoption of pro-rata recovery in tort).
28. Under the preponderance standard, a plaintiff with a less-than-even chance of avoiding harm will not be able to establish a prima facie argument that the defendant was the cause of his injury. Comment, *Proving Causation*, *supra* note 2, at 752.
29. *See* King, *supra* note 1, at 1365; Comment, *Proving Causation*, *supra* note 2, at 752.
30. It is likely that, notwithstanding instructions to apply the all-or-nothing principle, juries award damages for the loss of a chance. Orloff & Stedinger, *A Framework for Evaluating the Preponderance-of-the-Evidence Standard*, 131 U. PA. L. REV. 1159, 1173-74 (1983); Comment, *Proving Causation*, *supra* note 2, at 782-83 n.273.
31. The "all-or-nothing" rule requires that a plaintiff be awarded one hundred percent of damages attributable to a manifested injury if he meets the preponderance standard for proximate cause. A plaintiff not meeting this standard receives no damages award. *See generally* Cooper, *supra* note 10, at 209-15; Note, *Damages Contingent*, *supra* note 12, at 885-92. It has been suggested that the reason for the "all-or-nothing" rule is that American judges lack confidence in the jury's exercise of discretion. *See* C. MCCORMICK, *supra* note 13, § 26, at 101. Modern juries, however, have proven capable of assessing damages according to proportion of fault. *See, e.g.*, Sindell v. Abbott Laboratories, 26 Cal. 3d 588, 607 P.2d 924, 163 Cal. Rptr. 132, *cert. denied*, 449 U.S. 912 (1980) (market share liability).

gants attempt to establish that the chance did or did not exceed fifty percent.[32] Professor King asserts that the application of the "all-or-nothing" rule in loss of chance cases is arbitrary and that it "subverts the deterrence objectives of tort law by denying recovery for the effects of conduct that causes statistically demonstrable losses."[33] He notes that some courts, anxious to mitigate the harshness of the approach, have distorted the traditional preponderance standard for proving causation.[34]

2. Relaxed Standard for Proving Proximate Cause

Under a relaxed standard, a plaintiff with a less-than-even chance of avoiding harm can prove proximate cause by showing that the defendant's conduct substantially reduced the plaintiff's chance.[35] A case often cited as the leading authority of the relaxed standard for proving proximate cause is *Hicks v. United States*.[36] In *Hicks*, the plaintiff's decedent died from an obstruction of the small intestine.[37] The plaintiff alleged that the defendant negligently misdiagnosed the decedent's condition.[38] The United States Court of Appeals for the Fourth Circuit reversed the district court's dismissal of the case and held that the plaintiff may prove proximate cause where the defendant has substantially destroyed a chance of survival.[39] The court stated:

> When a defendant's negligent action or inaction has effectively terminated a person's chance of survival, it does not lie in the defendant's mouth to raise conjectures as to the measure of the chances that he has put beyond the possibility of realization. If there was any substantial possibility of survival and the defendant has destroyed it, he is answerable. Rarely is it possible to demonstrate to an absolute certainty what would have happened in circumstances that the wrongdoer did not allow to come to pass. The law does not in the existing circumstances

32. Because determining percentage probabilities in medicine is difficult, defendants often benefit from the uncertainty their conduct may have created. King, *supra* note 1, at 1378; *cf.* McBride v. United States, 462 F.2d 72, 75 (9th Cir. 1972) (noting that the best medical treatment cannot guarantee success and medicine is not an exact science); Jeanes v. Milner, 428 F.2d 598, 604 (8th Cir. 1970) (same); Hicks v. United States, 368 F.2d 626, 632 (4th Cir. 1966) (defendant should not benefit from uncertainty created by his conduct); Thompson v. Sun City Community Hosp., Inc., 141 Ariz. 597, 607, 688 P.2d 605, 615 (1984) (en banc) ("for every expert witness who evaluates the lost chance at 49% there is another who estimates it at closer to 51%").

33. King, *supra* note 1, at 1377; *see also infra* notes 85-86, 99 and accompanying text.

34. *Id.*; *see infra* notes 35-45 and accompanying text.

35. Consistent with the "all-or-nothing" principle, a plaintiff meeting this relaxed standard for proving causation will receive full compensation for his injuries. *See supra* notes 25-27 and accompanying text.

36. 368 F.2d 626 (4th Cir. 1966) (applying Virginia law). In *Hicks*, the plaintiff brought suit against a Navy doctor under the Federal Tort Claims Act. *Id.* at 628.

37. *Id.* at 629.

38. *Id.*

39. *Id.* at 632.

require the plaintiff to show to a *certainty* that the patient would have lived had she been hospitalized and operated on promptly.[40]

The above passage, however, is *dicta*; the uncontradicted expert testimony at trial established that with proper medical attention, the decedent would have had a better-than-even chance of survival.[41]

Some courts, concluding that *Hicks* relaxed the standard for proving proximate cause in loss of chance cases, have adopted a relaxed standard for proving causation in medical malpractice cases.[42] Section 323 of the

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40. *Id.* (emphasis in original). The court analogized to maritime cases which, in developing the "rescue doctrine," relaxed the standard for proving causation. Under the rescue doctrine, the captain of a ship has a duty to make a reasonable attempt to rescue an overboard seaman. *"[C]ausation is proved if the master's omission [in not conducting a search] destroys the reasonable possibility of rescue."* *Id.* at 633 (emphasis in original) (quoting Gardner v. National Bulk Carriers, Inc., 310 F.2d 284 (4th Cir. 1962), *cert. denied*, 372 U.S. 913 (1963)); *see also* Abbott v. United States Lines, 512 F.2d 118, 121 (4th Cir. 1975) (ship must conduct a search if a reasonable possibility of rescuing an overboard seaman exists); Kirincich v. Standard Dredging Co., 112 F.2d 163, 164 (3d Cir. 1940) (contributory negligence is no defense to the duty of rescue).

Some pre-*Hicks* negligence cases allowed a relaxed standard for proving causation. *See, e.g.*, Zinnel v. United States Shipping Bd. Emergency Fleet Corp., 10 F.2d 47 (2d Cir. 1925) (chance that a guard rope may have prevented a seaman from being swept overboard); Rovegno v. San Jose Knights of Columbus Hall Ass'n, 108 Cal. App. 591, 291 P. 848 (1930) (jury question as to whether absence of lifeguard from swimming pool was cause of drowning notwithstanding the fact that decedent may have drowned anyway); Harvey v. Silber, 300 Mich. 510, 2 N.W.2d 483 (1942) (defendant liable where his misdiagnosis of a bullet wound destroyed the patient's chance of survival); Burt v. Nichols, 264 Mo. 1, 173 S.W. 681 (1915) (landlord held liable for missing fire escape, even though decedent may have perished if there was a fire escape); Dunham v. Village of Canisteo, 303 N.Y. 498, 104 N.E.2d 872 (1952) (patient may have survived had he received prompt medical attention and not been confined for eighteen hours to a jail cell).

41. *Hicks*, 368 F.2d at 632; *see also* King, *supra* note 1, at 1368 n.53. Thus, *Hicks* did not change the standard for proving causation. *See* Clark v. United States, 402 F.2d 950, 953 n.4 (4th Cir. 1968) ("Certainly *Hicks* laid down no new rule of law with respect to either negligence or proximate cause . . ."); Weimer v. Hetrick, 309 Md. 536, 552-53, 525 A.2d 643, 651 (1987) (same).

42. *See, e.g.*, Daniels v. Hadley Memorial Hosp., 566 F.2d 749 (D.C. Cir. 1977) (recovery permitted when negligence destroys a substantial chance of survival); Ascher v. Gutierrez, 533 F.2d 1235 (D.C. Cir. 1976) (evidence sufficient that jury could have concluded that but for abandonment by anesthesiologist, plaintiff would not have suffered brain damage); Jeanes v. Milner, 428 F.2d 598 (8th Cir. 1970) (applying Arkansas law) (recovery permitted where doctor's misdiagnosis of a lymphosarcoma in the decedent's throat decreased his chance of survival from 35% to 24%); Brown v. United States, 419 F.2d 337 (8th Cir. 1969) (applying Missouri law) (causation proven where plaintiff loses a substantial possibility of survival); Mortensen v. Memorial Hosp., 105 A.D.2d 151, 483 N.Y.S.2d 264 (1984) (dismissing plaintiff's complaint, but recognizing with approval *Hicks* substantial possibility test); Kallenberg v. Beth Israel Hosp., 45 A.D.2d 177, 357 N.Y.S.2d 508 (1974) (per curiam), *aff'd mem.*, 37 N.Y. 719, 337 N.E.2d 128, 374 N.Y.S.2d 615 (1975) (recovery permitted where evidence showed decedent would have had a 20% to 40% chance of survival if the necessary medication had been received); Brown v. Koulizakis, 229 Va. 524, 331 S.E.2d 440 (1985) (recovery permitted if negligence de-

Restatement (Second) of Torts[43] which provides for recovery where the defendant's negligence increases the plaintiff's risk to physical harm, has also been relied upon by courts as justification for relaxing the standard for proving causation in loss of chance cases.[44] Courts utilizing section 323 permit recovery if the plaintiff has introduced evidence establishing that the defendant's conduct substantially increased the risk of harm to the plaintiff.[45]

Other jurisdictions, however, steadfastly adhere to the traditional preponderance standard.[46] A prominent case illustrating this position is

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prives patient of a substantial possibility of survival). *See generally* Bradt & Guthmann, *Recovery for the Value of a Chance in Medical Malpractice Cases: Bringing Minnesota's Standard of Causation Up to Date*, 12 WM. MITCHELL L. REV. 459 (1986); Giancola, *Proximate Cause in a Medical Malpractice Action: Kallenberg v. Beth Israel Hospital Revisited*, 22 TORT & INS. L.J. 324 (1987); Wright, *Causation in Tort Law*, 73 CALIF. L. REV. 1737 (1985); Annotation, *Medical Malpractice: "Loss of Chance" Causality*, 54 A.L.R.4th 10 (1987).

A *Hicks* standard has also been applied in negligence cases not involving medical malpractice. *See, e.g.*, Huddell v. Levin, 395 F. Supp. 64 (D.N.J. 1975) (plaintiff need not establish to a certainty that decedent, killed in an auto accident, would have been saved had head restraint not been defective), *vacated and remanded*, 537 F.2d 726 (3d Cir. 1976); Jackson v. Ray Kruse Constr. Co., 708 S.W.2d 664 (Mo. 1986) (en banc) (jury could find that landlord's inaction was a substantial cause of child being struck by a bicyclist because speed bumps were not installed on apartment complex's road).

43. RESTATEMENT (SECOND) OF TORTS § 323 (1965) provides:

> One who undertakes, gratuitously or for consideration, to render services to another which he should recognize as necessary for the protection of the other's person or things, is subject to liability to the other for physical harm resulting from his failure to exercise reasonable care to perform his undertaking if (a) his failure to exercise such care increases the risk of such harm, or
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> (b) the harm is suffered because of the other's reliance upon the undertaking.

Id.

44. *See, e.g.*, Foskey v. United States, 490 F. Supp. 1047 (D.R.I. 1979) (applying Pennsylvania law); Thompson v. Sun City Community Hosp., Inc., 141 Ariz. 597, 688 P.2d 605 (1984) (en banc); Sharp v. Kaiser Found. Health Plan, 710 P.2d 1153 (Colo. Ct. App. 1985); Chambers v. Rush-Presbyterian-St. Luke's Medical Center, 155 Ill. App. 3d 458, 508 N.E.2d 426 (1987); Northern Trust Co. v. Louis A. Weiss Memorial Hosp., 143 Ill. App. 3d 479, 493 N.E.2d 6, *cert. denied*, 112 Ill. 2d 579 (1986); Aasheim v. Humberger, 695 P.2d 825 (Mont. 1985); Evers v. Dollinger, 95 N.J. 399, 471 A.2d 405 (1984); Jones v. Montefiore Hosp., 494 Pa. 410, 431 A.2d 920 (1981); Gradel v. Inouye, 491 Pa. 534, 421 A.2d 674 (1980); Hamil v. Bashline, 243 Pa. Super. 227, 364 A.2d 1366 (1976), *vacated*, 481 Pa. 256, 392 A.2d 1280 (1978); Herskovits v. Group Health Coop., 99 Wash. 2d 609, 664 P.2d 474 (1983) (en banc); Thornton v. Charleston Area Medical Center, 305 S.E.2d 316 (W. Va. 1983).

45. *See generally* Note, *Increased Risk of Harm: A New Standard for Sufficiency of Evidence of Causation in Medical Malpractice Cases*, 65 B.U.L. REV. 275 (1985) [hereinafter Note, *Increased Risk of Harm*].

46. *See, e.g.*, Alfonso v. Lund, 783 F.2d 958 (10th Cir. 1986) (applying New Mexico law); Morgenroth v. Pacific Medical Center, 54 Cal. App. 3d 521, 126 Cal. Rptr. 681 (1976); Gooding v. University Hosp. Bldg., Inc., 445 So. 2d 1015 (Fla. 1984); Curry v. Summer, 136 Ill. App. 3d 468, 483 N.E.2d 711 (1985); Weimer v. Hetrick, 309 Md. 356, 525 A.2d 643 (1987); Glicklich v. Spievack, 16 Mass. App. Ct. 488,

Cooper v. Sisters of Charity of Cincinnati, Inc.[47] In *Cooper*, a 16-year-old boy was struck by a truck.[48] He was later treated by the defendant doctor at a hospital.[49] The plaintiff alleged that the defendant's failure to perform various tests and failure to perform a necessary surgical procedure resulted in the youth's death.[50] At trial, the evidence established that the boy would have had "around" a fifty percent chance of survival had the required surgery been performed.[51]

The Supreme Court of Ohio affirmed a directed verdict for the defendant,[52] holding that the plaintiff must establish proximate cause by a preponderance of the evidence.[53] Although acknowledging the temptation to relax the standard for proving causation in a wrongful death action,[54] the court remained firmly committed to the traditional preponderance standard.[55]

In *Weimer v. Hetrick*,[56] decided by the Court of Appeals of Maryland, a couple instituted a wrongful death action against an obstetrician.[57] The plaintiffs alleged that the doctor's failure to properly resuscitate their premature infant caused his death.[58] Evidence introduced at trial, however, showed that the underlying cause of the infant's death, asphyxia, was a direct consequence of his prematurity.[59] The jury found that the doctor's conduct was not the proximate cause of the death.[60]

On appeal, the plaintiffs argued that the standard for proving proximate cause should be relaxed, and that they should be allowed to recover

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452 N.E.2d 287, *review denied*, 390 Mass. 1103, 454 N.E.2d 1276 (1983); Cornfeldt v. Tongen, 295 N.W.2d 638 (Minn. 1980); Pillsbury-Flood v. Portsmouth Hosp., 128 N.H. 299, 512 A.2d 1126 (1986); Cooper v. Sisters of Charity of Cincinnati, Inc., 27 Ohio St. 2d 242, 272 N.E.2d 97 (1971); Sherer v. James, 290 S.C. 404, 351 S.E.2d 148 (1986); Lee v. Andrews, 545 S.W.2d 238 (Tex. Civ. App. 1976).

47. 27 Ohio St. 2d 242, 272 N.E.2d 97 (1971).
48. *Id.* at 242, 272 N.E.2d at 98-99.
49. *Id.* at 243, 272 N.E.2d at 99.
50. *Id.* at 245-47, 272 N.E.2d at 100-01.
51. *Id.* at 247, 272 N.E.2d at 101.
52. *Id.* at 254, 272 N.E.2d at 105.
53. *Id.* at 252, 272 N.E.2d at 103.
54. *Id.* at 251-52, 272 N.E.2d at 103. The court noted that "[t]he strong intuitive sense of humanity tends to emotionally direct us toward a conclusion that in an action for wrongful death an injured person should be compensated for the loss of any chance of survival, regardless of its remoteness." *Id.*
55. *Id.* at 252, 272 N.E.2d at 103.
56. 309 Md. 536, 525 A.2d 643 (1987).
57. *Id.* at 538-41, 525 A.2d at 644-46.
58. *Id.*
59. Hetrick v. Weimer, 67 Md. App. 522, 529, 508 A.2d 522, 525 (1986), *rev'd*, 309 Md. 536, 525 A.2d 643 (1987).
60. *Weimer*, 309 Md. at 541, 525 A.2d at 646. Counts of survivorship and wrongful death went to the jury. *Id.* at 541, 525 A.2d at 645-46. Only issues relating to the wrongful death action were considered by the court of appeals. The plaintiffs, because they took no exception at trial to the jury instruction given for the survivorship action, were precluded from raising loss of chance issues relating to that action on appeal. *Id.* at 545-46, 525 A.2d at 648.

if they proved that the doctor substantially reduced the child's chance of survival.[61] The court of appeals affirmed the jury verdict,[62] holding that "in an action under the wrongful death statute [the plaintiff] must show by a preponderance of the evidence that the [negligent] conduct of the defendant . . . was a proximate cause of the death of the decedent."[63] The courts in these decisions, while failing to recognize chances as protected interests, correctly refrained from distorting the preponderance standard for proving proximate cause.

C. *Recognition of Chances as Protected Interests*

In order to reach more equitable results in loss of chance cases, courts should turn their focus away from proximate cause and recognize that chances are protected interests. In tort, an injury is not limited to a tangible physical harm, but includes the invasion of any protected interest.[64] Thus, in addition to manifested physical injuries, lost chances should be compensable interests.[65] In loss of chance cases, a plaintiff should recover for the percentage probability that his chance of avoiding

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61. *Id.* at 541-43, 525 A.2d at 646-47. The plaintiffs requested a jury instruction consistent with *Hicks*, providing that the jury should find causation if the doctor substantially reduced the child's chance of survival. *Id.* at 643, 525 A.2d at 647. The plaintiffs contended that an earlier Maryland case, *Thomas v. Corso*, 265 Md. 84, 288 A.2d 379 (1972), permitted such an instruction. The Court of Appeals of Maryland held, however, that *Corso* did not alter the burden of proving causation. *Weimer*, 309 Md. at 551-52, 525 A.2d at 650-51; *see also* Cooper v. Hartman, 311 Md. 259, 261, 533 A.2d 1294, 1294-95 (1987) (*Corso* did not create either a new tort or an additional basis for determining damages); King, *supra* note 1, at 1369 n.53 (upon close examination the precedential force or scope of *Corso* may be limited). *But see* Wolfstone & Wolfstone, *Recovery of Damages for the Loss of a Chance*, 28 MED. TRIAL TECH. Q. 121, 135 (1982) (asserts that *Corso* did change the standard of proof); Comment, *Proving Causation*, *supra* note 2, at 759 (same).

62. 309 Md. at 555, 525 A.2d at 652 (reversing the Court of Special Appeals of Maryland).

63. *Id.* at 554, 525 A.2d at 652. The court concluded by noting that the Maryland wrongful death statute is in derogation of the common law and therefore must be strictly construed. *Id.* As such, the standard of causation cannot be relaxed through judicial interpretation. *Id.*

In *Weimer*, the court of special appeals explicitly recognized the loss of a chance of survival as a compensable injury. *Weimer*, 67 Md. App. at 541, 508 A.2d at 531, *rev'd*, 309 Md. 536, 525 A.2d 643 (1987). The court of appeals, however, determined that this issue, properly pursued in the survivorship action, was not raised on appeal. *Weimer*, 309 Md. at 545-46, 553 n.7, 525 A.2d at 648, 651 n.7; *see also supra* note 61. The court speculated that the plaintiff did not bring a loss of chance of survival action due to the court's holding in *Rhone v. Fisher*, 224 Md. 223, 167 A.2d 773 (1961). *Weimer*, 309 Md. at 546 n.6, 525 A.2d at 648 n.6. In *Rhone*, the court of appeals held that the shortening of one's life expectancy is not a compensable injury. *Rhone*, 224 Md. at 230, 167 A.2d at 778.

64. *See* RESTATEMENT (SECOND) OF TORTS § 281 (1965) (actor is liable if the interest invaded is protected against unintentional invasion); *see also* Note, *Increased Risk of Cancer as an Actionable Injury*, 18 GA. L. REV. 563, 588 (1984) [hereinafter Note, *Increased Risk of Cancer*].

65. *See* King, *supra* note 1, at 1354; Wolfstone & Wolfstone, *supra* note 61, at 122-23.

harm was diminished.[66]

Several recent decisions involving medical malpractice have permitted recovery for the loss of a chance.[67] In *James v. United States*,[68] for example, the United States District Court for the Northern District of California recognized that a lost chance of survival is a protected interest.[69] The *James* court awarded the plaintiff damages for a loss of chance of survival stemming from delayed diagnosis and treatment of lung cancer.[70] The court observed that "[n]o matter how small that chance may have been . . . no one can say that the chance of prolonging one's life or decreasing suffering is valueless."[71]

In *DeBurkarte v. Louvar*,[72] the defendant's failure to diagnose the plaintiff's breast cancer at an early stage caused the disease to spread to the plaintiff's spine and leg.[73] Furthermore, the plaintiff had to undergo a mastectomy and radiation treatment.[74] The plaintiff brought suit, alleging that the doctor's negligence caused her to lose a chance of survival.[75]

The Supreme Court of Iowa upheld a verdict for the plaintiff.[76] The

66. King, *supra* note 1, at 1382. Professor King asserts that pro-rata recovery should also be awarded for better-than-even chances. *Id.* at 1387. See *infra* notes 112-29 and accompanying text for a detailed discussion of theories for computing damages.

67. *See, e.g.*, Waffen v. United States Dep't of Health & Human Serv., 799 F.2d 911 (4th Cir. 1986) (applying Maryland law) (decided prior to the Court of Appeals of Maryland's decision in *Weimer*; recovery was denied because the lost chance was *de minimis*); O'Brien v. Stover, 443 F.2d 1013 (8th Cir. 1971) (applying Iowa law) (plaintiff recovered for reduction of chance of survival from cancer); Mays v. United States, 608 F. Supp. 1476 (D. Colo. 1985) (same), *rev'd on other grounds*, 806 F.2d 976 (10th Cir. 1986), *cert. denied*, 107 S. Ct. 3184 (1987); James v. United States, 483 F. Supp. 581 (N.D. Cal. 1980) (same); Tappan v. Florida Medical Center, Inc., 488 So. 2d 630 (Fla. Dist. Ct. App. 1986) (implied that recovery for lost chance of survival would be permitted); Williams v. Bay Hosp., Inc., 471 So. 2d 626 (Fla. Dist. Ct. App. 1985) (same); Sanders v. Ghrist, 421 N.W.2d 520 (Iowa 1988) (plaintiffs entitled to jury instruction for lost chance of survival); DeBurkarte v. Louvar, 393 N.W.2d 131 (Iowa 1986) (en banc) (recovery for loss of chance of survival); Hetrick v. Weimer, 67 Md. App. 522, 508 A.2d 522 (1986) (same), *rev'd on other grounds*, 309 Md. 536, 525 A.2d 643 (1987); McKellips v. Saint Francis Hosp., Inc., 741 P.2d 467 (Okla. 1987) (same); Bellaire Gen. Hosp., Inc. v. Campbell, 510 S.W.2d 94 (Tex. Civ. App. 1974) (same). *But see* Clayton v. Thompson, 475 So. 2d 439 (Miss. 1985) (rejects any theory of recovery for the loss of a chance).

English courts also permit pro-rata recovery in medical malpractice cases. *See* Case Report, *Delay in Diagnosis Resulting in 25% Loss of Chance of Good Recovery: Damages Awarded*, 54 MEDICO LEGAL J. 54 (1986) (summarizing Hotson v. Fitzgerald, 3 All E.R. 167 (Q.B. 1985), *rev'd sub nom.* Hotson v. East Berkshire Area Health Auth., 2 All E.R. 909 (H.L. 1987)).

68. 483 F. Supp. 581 (N.D. Cal. 1980).

69. *Id.* at 587.

70. *Id.* The court ruled that the plaintiff's recovery was attributable to "the loss of the opportunity for earlier and possibly more effective treatment. . . ." *Id.*

71. *Id.*

72. 393 N.W.2d 131 (Iowa 1986) (en banc).

73. *Id.* at 132.

74. *Id.*

75. *Id.*

76. *Id.* at 140.

court held that the plaintiff should be allowed to recover for the lost chance.[77] "Allowing recovery for the lost chance is . . . the most equitable approach because '[b]ut for the defendant's tortious conduct, it would not have been necessary to grapple with the imponderables of chance.' "[78] Furthermore, the court noted that the tort system of loss allocation dictated that damages be assessed according to the percentage the defendant's conduct reduced the plaintiff's chance of survival.[79]

The recognition of chances as protected interests best serves public policy. Without this protection, a patient with a less-than-even chance of avoiding harm or death would have no legal recourse against a doctor's negligent medical treatment.[80] This would result in a blanket release of doctors treating such patients, leaving many instances of negligent conduct unchecked.[81] Moreover, an individual whose chance of survival has been reduced may lose the opportunity to benefit from any scientific breakthrough if the defendant's negligence has shortened the individual's expected lifespan.[82] Also, distortion of the preponderance standard would be unnecessary; a plaintiff in a loss of chance case would have to prove, consistent with the traditional preponderance standard, that the defendant proximately caused his injury — the lost chance.[83]

Those opposed to the recognition of chances as protected interests assert that providing an additional cause of action to patients will increase the cost of medical malpractice insurance and that such costs are passed on to patients in the form of higher costs for medical care.[84] Insurance costs, however, would likely be reduced because the quality and efficiency of health care would be strengthened by the deterrence placed

77. *Id.* at 137.

78. *Id.* (quoting King, *supra* note 1, at 1378). Expert testimony at trial established that the plaintiff had a 50% to 80% chance of survival at the time of the defendant's negligence. *Id.* at 137. The chance was reduced to zero at the time of the trial. *Id.* The supreme court ruled that the trial court's jury instruction, limiting damages to this reduction, was correct. *Id.* at 138. The court noted that this instruction precluded recovery for all damage relating to the underlying injury — the cancer. *Id.*

79. *Id.*

80. *See infra* notes 81-82 and accompanying text.

81. *See* Roberson v. Counselman, 235 Kan. 1006, 1021, 686 P.2d 149, 160 (1984) (to hold otherwise would put those with less than a 50% chance of recovery at the mercy of doctors); Herskovits v. Group Health Coop., 99 Wash. 2d 609, 614, 664 P.2d 474, 477 (1983) (en banc) (not permitting recovery would result in a "blanket release" from liability of doctors and hospitals when the patient has less than a 50% chance of survival).

82. Comment, *Proving Causation*, *supra* note 2, at 772 n.213. Although compensating these individuals for the lost chance will, of course, not restore their health, it is our legal system's only method for providing recovery for their injuries.

83. *See supra* notes 20-23 and accompanying text.

84. *See* Note, *Increased Risk of Harm*, *supra* note 45, at 306-09; *see also* REPORT OF THE JOINT EXECUTIVE/LEGISLATIVE TASK FORCE ON MEDICAL MALPRACTICE INSURANCE, at 12 (Dec. 1985) (noting that four of the primary underwriters of medical malpractice insurance in Maryland raised their rates due to the increased number of claims and higher litigation costs).

on negligent health care practice.[85] Permitting recovery for valid tort claims operates to decrease instances of medical malpractice by compelling doctors to practice defensive medicine by performing sufficient tests to make accurate diagnoses, investing in continuing professional education and training, and abandoning procedures they cannot competently perform.[86] Thus, this reduction in instances of medical malpractice would result in lower insurance premiums and lower costs to patients.

Opponents also argue that recognition of the loss of a chance as a protected interest will "open the floodgates of litigation."[87] The court system, however, particularly through the utilization of arbitration or medical malpractice screening tribunals, weeds out frivolous claims.[88] Furthermore, courts could also prevent a flood of loss of chance cases by refusing to permit recovery where the injury is *de minimis*.[89]

III. RECOVERY FOR INCREASED RISK

Increased risk situations arise where the negligent conduct of the defendant causes the plaintiff to incur an increased risk or susceptibility to a physical harm or disease.[90] Increased risk cases are related conceptually to loss of chance situations. In both circumstances, negligent defendants cause statistically measurable harm to plaintiffs. Courts which permit recovery for loss of chance and increased risk do not include the chance in their determination of the causation of the manifested physical injury, but instead recognize chances as protected interests.[91] Thus,

85. Note, *Increased Risk of Harm*, *supra* note 45, at 306-09; *see also* R. POSNER, ECONOMIC ANALYSIS OF LAW, § 6.14, at 186-87 (1986) (the economic function of the tort negligence system is the deterrence of inefficient accidents).

86. Note, *Increased Risk of Harm*, *supra* note 45, at 306-07. Individuals gauge amounts to be invested on safety precautions against accidents on a cost analysis basis. R. POSNER, *supra* note 85, § 6.1, at 147-51. Precautions are increased when the potential costs associated with tort liability outweigh the costs of taking precautions against possible negligence. *Id.*; *see also* Furrow, *Medical Malpractice and Cost Containment: Tightening the Screws*, 36 CASE W. RES. L. REV. 985, 991 (1986) ("Anticipation of liability propels potential defendants into taking further safety precautions. . . ."). *See generally* Brook, Brutoco & Williams, *The Relationship Between Medical Malpractice and Quality of Care*, 1975 DUKE L.J. 1197 (1975).

87. *See* Note, *Increased Risk of Harm*, *supra* note 45, at 309-11. This argument is commonly asserted against the recognition of any new cause of action.

88. In 1976, the Maryland General Assembly passed the Maryland Health Claims Arbitration Act. 1976 Md. Laws 495 (codified at MD. CTS. & JUD. PROC. CODE ANN. §§ 3-2A-01 to 3-2A-09 (1984 & Supp. 1987)). It has been asserted that this law has not met its purported goals of "weeding out" frivolous claims and easing court dockets. MacAlister & Scanlan, *Health Claims Arbitration in Maryland: The Experiment Has Failed*, 14 U. BALT. L. REV. 481, 500-04 (1985).

89. *See* Waffen v. United States Dep't of Health & Human Serv., 799 F.2d 911, 922-23 (4th Cir. 1986) (plaintiff was denied recovery because lost chance was *de minimis*).

90. *See generally* R. POSNER, *supra* note 85, § 6.7, at 168; J. STEIN, DAMAGES AND RECOVERY § 106, at 182-84 (1972); Note, *Increased Risk of Cancer*, *supra* note 64; Comment, *Increased Risk of Disease From Hazardous Waste: A Proposal For Judicial Relief*, 60 WASH. L. REV. 635 (1985) [hereinafter Comment, *Increased Risk of Disease*].

91. *See generally infra* notes 112-29 and accompanying text.

many courts have permitted recovery for increased risk using a rationale similar to that utilized by courts permitting recovery in loss of chance cases.[92]

As in loss of chance cases, many courts erroneously focus on the increased risk as a factor in determining proximate cause.[93] Thus, in a jurisdiction which does not recognize increased risk as a compensable harm, a plaintiff can recover only for the disease or injury to which they have become susceptible. Injuries arising from an industrial or nuclear accident may not manifest themselves for many years. In these, or other similar situations, a plaintiff faces a difficult decision. He may immediately pursue recovery for the disease or postpone any action until the disease manifests itself.

If the plaintiff pursues an immediate remedy he will encounter difficulty establishing proximate cause if his risk of contracting the disease is less than fifty percent.[94] If the disease has yet to manifest itself, the plaintiff will not be able to prove damages [95] and any future suit may be barred by the doctrine of *res judicata*.[96] This would preclude any recovery of damages should the disease later manifest itself.

If the plaintiff chooses to postpone any remedy until his actual damages are ascertained, his action may be barred by a statute of limitations

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92. *See infra* notes 100, 102-05 and accompanying text.

93. *See, e.g.*, Wilson v. Johns-Manville Sales Corp., 684 F.2d 111, 119-20 (D.C. Cir. 1982) (plaintiff must meet reasonable certainty standard for proving future injuries or damage); Eagle-Picher Indus. v. Cox, 481 So. 2d 517, 521-24 (Fla. Dist. Ct. App. 1985) (permitting recovery for increased chance encourages the use of speculative evidence); Pierce v. Johns-Manville Sales Corp., 296 Md. 656, 666-69, 464 A.2d 1020, 1026-28 (1983) (damages for prospective harm may only be recovered where the harm will probably or certainly be manifested); Davidson v. Miller, 276 Md. 54, 62, 344 A.2d 422, 427-28 (1975) (same); Jordan v. Bero, 210 S.E.2d 618, 634 (W. Va. 1974) (same). *See generally* King, *supra* note 1, at 1370-73; Comment, *The Right to Recover*, *supra* note 3, at 991-92.

94. Unless suit is brought in a jurisdiction which has relaxed the standard for proving causation, the plaintiff will not be able to establish proximate cause. *See supra* notes 24-34 and accompanying text; *see also Wilson*, 684 F.2d at 119; *Pierce*, 296 Md. at 666, 464 A.2d at 1026; King, *supra* note 1, at 1372-73; Note, *Increased Risk of Cancer*, *supra* note 64, at 637-39; Comment, *Increased Risk of Disease*, *supra* note 90, at 637-39.

95. Until the disease manifests itself, the plaintiff will not know the extent of costs for his health care, medicine, lost wages and disability. *See* Wilson, 684 F.2d at 120 (noting that calculation of damages for lung cancer when the disease was not yet manifested is too speculative for the plaintiff to recover); *Pierce*, 296 Md. at 666, 464 A.2d at 1026 (same).

96. Generally,

> the doctrine of res judicata is that an existing final judgment rendered upon the merits, without fraud or collusion, by a court of competent jurisdiction, is conclusive of causes of action and of facts or issues thereby litigated as to the parties and their privies, in all other actions in the same or any other judicial tribunal of concurrent jurisdiction.

46 AM. JUR. 2D *Judgments* § 394 (1969); *see also* Harding v. Ramsay, Scarlett & Co., 599 F. Supp. 180, 183 (D. Md. 1984) (discussing the application of *res judicata* in Maryland).

in jurisdictions not recognizing the discovery rule.[97] Even if the discovery rule applies, allowing the plaintiff to bring suit, a plaintiff who waits years to litigate a claim faces other impediments including lost evidence, faded memories and disappearing witnesses.[98] Furthermore, the defendant, especially a corporate defendant, may no longer be in existence or may be judgment proof.[99]

Recognizing the inequities faced by plaintiffs under these circumstances, some courts view increased risk as a redressable injury and have assessed damages according to the increase in susceptibility to injury or disease caused by the defendant's conduct.[100] Other courts, while recognizing the unfairness in such situations, do not permit recovery for the

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97. *See* Note, *Increased Risk of Cancer*, *supra* note 64, at 575. Under the discovery rule, a cause of action accrues when a "wrong is discovered or with due diligence it should have been discovered." Poffenberger v. Risser, 290 Md. 631, 634-35, 431 A.2d 677, 679 (1981). In Maryland, the discovery rule is applicable in all civil actions. *Id.* at 636, 431 A.2d at 680.

An action against a health care provider, however, must be brought "within the earlier of: (1) Five years of the time the injury was committed; or (2) Three years of the date the injury was discovered." MD. CTS. & JUD. PROC. CODE ANN. § 5-109 (Supp. 1987). In 1987, the Maryland General Assembly further limited the applicability of the discovery rule. The age at which the statute of limitations commences for minors, in actions against health care providers, has been reduced from age sixteen to age eleven. *See* 1987 Md. Laws 2703 (codified at § 5-109(b)). Also, any action for damages arising out of an occupational disease must be brought "within 3 years of the discovery of facts from which it was known or reasonably should have been known that an occupational disease was the proximate cause of death, but in any event not later than 10 years from the date of death." § 5-113.

98. Note, *Increased Risk of Cancer*, *supra* note 64, at 574 ("cancer symptoms first appear many years after [negligent conduct], long after evidence necessary to establish the defendant's negligence has been lost or destroyed"). In *Pierce*, the Court of Appeals of Maryland noted that these factors encourage prompt adjudication of claims. *Pierce*, 296 Md. at 665-66, 464 A.2d at 1026.

99. *See* Note, *Increased Risk of Cancer*, *supra* note 64, at 575. The author also asserts that a prompt action for increased susceptibility more effectively deters corporations from conducting tortious activity than a later action for the manifested result of a tort. *Id.* at 582-86; *see also* Comment, *Increased Risk of Disease*, *supra* note 90, at 645 (potential future lawsuits do not encourage present safeguards against the mishandling of hazardous waste).

100. *See, e.g.*, Martin v. City of New Orleans, 678 F.2d 1321 (5th Cir. 1982) (applying Louisiana law) (plaintiff incurred a risk of future medical complications due to bullet lodged in his neck), *cert. denied*, 459 U.S. 1203 (1983); Sterling v. Velsicol Chemical Corp., 647 F. Supp. 303 (W.D. Tenn. 1986) (recovery allowed for increased susceptibility to liver and kidney cancer); Starlings v. Ski Roundtop Corp., 493 F. Supp. 507 (M.D. Pa. 1980) (recovery allowed for increased risk of developing arthritis); McCall v. United States, 206 F. Supp. 421 (E.D. Va. 1962) (recovery allowed for an increased chance of becoming epileptic); Linsay v. Appleby, 91 Ill. App. 3d 705, 414 N.E.2d 885 (1980) (recovery allowed for risk of injury related to plaintiff's predisposition to seizures); Davis v. Graviss, 672 S.W.2d 928 (Ky. 1984) (recovery allowed for increased susceptibility to meningitis); Charlton Bros. Transp. Co. v. Garrettson, 188 Md. 85, 51 A.2d 642 (1947) (recovery allowed for increased hazard of a recurring hernia); Feist v. Sears, Roebuck & Co., 267 Or. 402, 517 P.2d 675 (1973) (recovery allowed for increased susceptibility to meningitis); Schwegel v. Goldberg, 209 Pa. Super. 280, 228 A.2d 405 (1967) (recovery allowed for increased chance of developing seizures).

increased chance, but have allowed recovery for the cost of medical surveillance of the plaintiff's condition.[101]

In *Sterling v. Velsicol Chemical Corp.*,[102] the plaintiffs brought a class action suit against the defendant,[103] alleging that hazardous chemical waste seeping from a burial site on the defendant's property into the plaintiffs' well water caused them to incur an enhanced susceptibility to liver and kidney cancer.[104] The United States District Court for the Western District of Tennessee allowed the plaintiffs to recover for their injuries, recognizing that "enhanced susceptibility is an existing condition, and not a speculative future injury."[105]

One court, in disallowing recovery for increased risk, noted that plaintiffs who later manifest the disease to which they have become more susceptible, will be undercompensated.[106] Having recovered for the increased risk, they are estopped from pursuing an action for the manifested disease.[107] Furthermore, a plaintiff who fails to contract the disease has received a financial windfall.[108] This argument does not recognize the increased risk as a compensable injury which is separate and distinct from the manifestation of the disease itself. Thus, for example, a court should permit a plaintiff to recover for an increased susceptibility to cancer, and commence a second action if the latent disease manifests itself.[109] Any recovery received in the second action would be discounted by damages received in the first action.[110]

The underlying rationale for permitting recovery for increased risk and loss of chance is the recognition of chances as protected interests. Thus, a jurisdiction which recognizes a cause of action for either increased risk or loss of chance should necessarily recognize a cause of action for the other.[111] Recognition of both causes of action would result in the most equitable distribution of resources among litigants.

IV. VALUATION OF CHANCES

If a court determines that the loss of a chance or an increased risk

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101. *See, e.g.*, Herber v. Johns-Manville Corp., 785 F.2d 79 (3d Cir. 1986) (applying New Jersey law); Devlin v. Johns-Manville Corp., 202 N.J. Super. 556, 495 A.2d 495 (1985). It has also been suggested that insurance coverage should be awarded in lieu of monetary relief when an individual has been exposed to an increased risk of disease. *See* Comment, *Increased Risk of Disease*, *supra* note 90, at 650.
102. 647 F. Supp. 303 (W.D. Tenn. 1986).
103. *Id.* at 306.
104. *Id.* at 308.
105. *Id.* at 322.
106. *See* Eagle-Picher Indus. v. Cox, 481 So. 2d 517, 524 (Fla. Dist. Ct. App. 1985).
107. *Id.*
108. *Id.*
109. Principles of *res judicata* would not apply because the second action is brought for a new injury. *See generally supra* note 96.
110. *See* King, *supra* note 1, at 1382 ("Compensation should be calculated in a way that avoids double recovery for the same injury").
111. *See supra* notes 90-92 and accompanying text.

are compensable injuries, it must formulate a method to assess damages properly. Generally, there are two methods of valuing chances.[112] First, a court could permit the trier of fact to value the chance without judicial instruction, permitting the trier of fact to utilize their perception of the plaintiff's injury and value it according to its experience, judgment, and everyday common sense.[113]

This method is the simplest because the introduction of statistical evidence is unnecessary.[114] The goals of substantial justice and precise loss allocation between the litigants, however, are not satisfied unless a more predictable and rational method of calculating damages is employed.[115]

A preferable method for the valuation of chances is to value the injury according the percentage probability that the plaintiff's chance of avoiding harm has diminished.[116] In loss of chance cases, the percentage probability method is applied by determining the diminution of the plaintiff's chance of avoiding harm.[117] Thus, in the loss of chance of survival scenario depicted in the Introduction, where the plaintiff's chance of survival has been reduced from forty to twenty percent, the plaintiff should receive twenty percent of the value of the decedent's life.[118] This method of calculating damages offers greater precision than the previous method and does not impose an unduly difficult mathematical task on the trier of

112. *See* King, *supra* note 1, at 1381-87.

113. *Id.* at 1381-82.

114. Professor Tribe argues "that the costs of attempting to integrate mathematics into the factfinding process of a legal trial outweigh the benefits." Tribe, *Trial By Mathematics: Precision and Ritual In the Legal Process*, 84 HARV. L. REV. 1329, 1377 (1971). Tribe points out several costs of using statistical data, including: (1) the distortion of results due to the "overimpressiveness" of numbers; (2) those factors which cannot be quantified may, in the eyes of the trier of fact, lose their relative importance; (3) and the weighing process conducted by a jury may be "dehumanized" by excessive use of statistical data. *Id.* at 1361, 1365, 1375-76.

The use of statistical data, however, appears to be inherently necessary to calculate damages if chances are to be deemed compensable interests. King, *supra* note 1, at 1385. Loss of chance plaintiffs must introduce statistics to establish the extent of their injuries. Comment, *Proving Causation*, *supra* note 2, at 786. Even Professor Tribe concedes that "*all* factual evidence is ultimately 'statistical,' and all legal proof ultimately 'probabilistic,' in the epistemological sense. . . ." Tribe, *supra*, at 1330 n.2 (emphasis in original). Moreover, juries have proven themselves to be competent in handling statistical data. *See supra* note 3; *see also* Comment, *Proving Causation*, *supra* note 2, at 786 n.291 (noting the use of statistics in civil rights, antitrust, and fraud actions).

115. King, *supra* note 1, at 1382. Although medicine is not an exact science, statistics may be utilized to quantify medical data with some precision. *See supra* note 8; *infra* notes 118-19.

116. King, *supra* note 1, at 1382.

117. *Id.*

118. This result is reached by subtracting the 20% chance of survival from the 40% chance of survival. The trier of fact would determine the total loss attributable to an injury taking into consideration factors such as the extent of any physical disability, pain and suffering, lost wages, and medical expenses. *See generally* R. GILBERT, P. GILBERT & R. GILBERT, MARYLAND TORT LAW HANDBOOK, § 25.1.2, at 249-51 (1986).

fact.[119]

The application of the percentage probability method is more complicated in increased risk cases, because these cases depend upon the prediction of a series of future events.[120] The percentage probability method may be applied in two ways, the "single outcome" calculation or the "weighted mean" calculation.[121] Using the single outcome calculation, the trier of fact would determine the most likely time for the occurrence of the future harm or disease; next, the trier of fact must determine the loss attributable to the harm at that time.[122] Finally, damages are determined by multiplying the probability that the plaintiff may incur that harm at that time by the loss.[123]

The most accurate method of determining probabilities in increased risk cases, however, is the "weighted mean" calculation.[124] Under this method, the trier of fact is required to compute the " 'weighted average of all possible outcomes, the weight assigned to each outcome being determined by the likelihood of its occurrence.' "[125]

The difference between the simple probability and weighted mean methods is best understood through the following illustration.[126] Suppose that the defendant's negligence causes the plaintiff to incur an increased susceptibility to blindness and the chance of the blindness occurring at any time during the plaintiff's lifetime is thirty percent. Utilizing the simple probability method, the trier of fact must determine the most likely time the blindness will occur and the loss attributable to blindness occurring at that time. Assume that the most likely age for the onset of blindness is determined to be age fifty and that the loss attributable to the condition is $100,000. The trier of fact would multiply $100,000 by the thirty percent increased susceptibility and award the plaintiff $30,000.

The weighted mean method more accurately determines damages by allowing consideration of other possible outcomes. Thus, assume that the plaintiff has a twenty-five percent chance of becoming blind at age fifty, a four percent chance at age forty, and a one percent chance at age thirty. Furthermore, the damages will be $100,000 if blindness occurs at

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119. Epidemiologic proof may be used to ascertain damages in chance cases. *See generally* Black & Lilienfeld, *Epidemiologic Proof in Toxic Tort Litigation*, 52 FORDHAM L. REV. 732 (1984). Epidemiology is a "scientific discipline that deals with the integrated use of statistics and biological/medical science to identify and establish the causes of human disease." *Id.* at 736.

120. King, *supra* note 1, at 1383. Damages for future losses will be reduced to present value; *see* C. MCCORMICK, *supra* note 13, § 86, at 304. Complex present value calculations are routinely undertaken to determine future lost wages. *See also supra* note 114.

121. King, *supra* note 1, at 1383-85.

122. *Id.* at 1383.

123. *Id.*

124. *Id.* at 1384.

125. *Id.* (quoting Schaefer, *supra* note 11, at 722).

126. *Id.* at 1383-84.

age fifty, $200,000 at age forty, and $300,000 at age thirty. The damages would be calculated by aggregating these possible outcomes. Thus, compensable damages would be the sum of $25,000, (twenty-five percent multiplied by $100,000), $8,000 (four percent multiplied by $200,000), and $3,000 (one percent multiplied by $300,000), or a total damage award of $36,000.

Although the weighted mean method is the most complicated of the three methods, juries, with proper instruction, have proven capable of handling complex statistical data.[127] Because most factual scenarios produce an infinite number of possible outcomes,[128] courts will have to weigh the goals of precision and manageability to limit the number of possible outcomes used in the calculation.[129] Still, the weighted mean method remains the most precise calculation for the equitable distribution of damage awards in increased risk cases.

V. CHANCE LITIGATION IN MARYLAND: WHAT NEXT?

No direct precedent for the recognition of a cause of action for the loss of a chance exists in Maryland.[130] The court of special appeals, in *Weimer*, explicitly recognized the loss of a chance of survival as a compensable injury.[131] The court of appeals, however, reversed, holding that the issue as to whether chances are protected interests was not raised on appeal.[132] The court added that whether *Hicks*' language[133] "will prove to be an augury of a burgeoning new tort or introduce a new factor for consideration of damages in tort cases producing injury or death are issues for another day . . . ."[134]

The court of special appeals decision in *Weimer* and the Fourth Circuit's subsequent reliance on that decision in *Waffen v. United States De-*

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127. *See supra* notes 31 and 114.
128. *See* King, *supra* note 1, at 1384. A plaintiff might introduce evidence displaying a different possible outcome for every day of his remaining life.
129. A court could limit the introduction of statistical data into evidence by limiting such evidence to yearly, or some other, less frequent change in possible outcomes.
130. *See supra* notes 56-63 and accompanying text.
131. Hetrick v. Weimer, 67 Md. App. 522, 541, 508 A.2d 522, 531 (1986), *rev'd*, 309 Md. 536, 525 A.2d 643 (1987).
132. Weimer v. Hetrick, 309 Md. 536, 545-46, 553 n.7, 525 A.2d 643, 648, 651 n.7 (1987).
133. *See supra* notes 35-41 and accompanying text.
134. *Weimer*, 309 Md. at 553, 525 A.2d at 652; *see also id.* at 556, 525 A.2d at 653 (McAuliffe, J., concurring) ("I am unwilling to say that neither *Hicks v. United States* . . . nor *Thomas v. Corso* . . . suggests a favorable inclination toward a claim for damages resulting from the loss of a substantial chance of survival").

In *Cooper v. Hartman*, 311 Md. 259, 533 A.2d 1294 (1987), the court of appeals remanded a case which presented loss of chance issues. In that case, the plaintiff asserted that the failure of the defendant to diagnose a bone infection caused him to lose a two-inch section of his right leg. *Id.* at 261-62, 533 A.2d at 1295. The court remanded the case for a new trial, holding that the plaintiff's failure to present quantitative evidence regarding his chance of avoiding the damage to his leg, precluded a finding for the plaintiff. *Id.* at 269-72, 533 A.2d at 1299-1300.

partment of Health & Human Services[135] are well-reasoned opinions which explain why chances should be protected interests. "[I]t is better to consider the loss of a substantial chance of survival as a different type of *loss* with a different measure of damages than the loss of life, instead of treating the former as a variation of the burden of proving *causation* in a claim for negligently causing the patient's death."[136]

There is precedent for the recognition of a cause of action for increased risk. In *Charlton Bros. Transportation Co. v. Garrettson*,[137] the plaintiff was thrown from his seat on a street car when the car collided with a tractor-trailer.[138] He suffered an increased susceptibility to a hernia.[139] Prior to the fall his risk was ten percent; after the injury his risk increased to fifty percent.[140] Notwithstanding the fact that the plaintiff sustained a less-than-even chance of suffering a hernia, the court of appeals recognized the increased susceptibility as an injury and allowed the plaintiff to recover damages for the harm he incurred.[141]

The court of appeals, in permitting recovery for increased risk in *Garrettson*, has accepted the underlying rationale — that chances are protected interests — which supports the recognition of a cause of action for loss of chance.[142] Furthermore, Judge McAuliffe's concurring opinion in *Weimer* indicates a strong inclination toward the adoption of a cause of action for loss of chance of survival.[143] The recognition of chances as protected interests in Maryland would result in the most equitable disposition of cases involving plaintiffs who have suffered statistically demonstrable injuries resulting from another's negligence.

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135. 799 F.2d 911 (4th Cir. 1986).
136. *Id.* at 919 (emphasis in original).
137. 188 Md. 85, 51 A.2d 642 (1947).
138. *Id.* at 90, 51 A.2d at 644.
139. *Id.* at 94, 51 A.2d at 646.
140. *Id.*
141. *Id.* at 94-95, 51 A.2d at 646. Two subsequent court of appeals decisions have seemingly lessened Garrettson's precendential value. In *Pierce v. Johns-Manville Sales Corp.*, 296 Md. 656, 464 A.2d 1020 (1983), the plaintiff developed an increased risk to lung cancer due to extended exposure to asbestos. *Id.* at 658-59, 464 A.2d at 1022. In *Davidson v. Miller*, 276 Md. 54, 344 A.2d 422 (1975), the plaintiff, a young girl, was severely injured when she was struck by a truck. *Id.* at 56-57, 344 A.2d at 425. Injuries to her pelvis caused her to suffer an increased risk that she could bear children only by caesarean section. *Id.* at 57, 344 A.2d at 425.

In both cases, the court of appeals did not recognize chances as protected, compensable interests; the court included the increased risks as factors for determining the proximate cause of the plaintiffs' unmanifested physical conditions. *See Pierce*, 296 Md. at 666-68, 464 A.2d at 1026-28; *Davidson*, 276 Md. at 62, 344 A.2d at 427-28. *Garrettson* was not discussed in either of these decisions. *See Pierce*, 296 Md. 656, 464 A.2d 1020; *Davidson*, 276 Md. 54, 344 A.2d 422.

142. *See supra* notes 90-92 and accompanying text.
143. *See Weimer*, 309 Md. at 556, 525 A.2d at 653 (McAuliffe, J., concurring). In *Cooper v. Hartman*, 311 Md. 259, 264-67, 533 A.2d 1294, 1296-98 (1987), the court of appeals discussed at length the recent popularity of the loss of chance doctrine. The court, however, did not decide whether the doctrine exists in Maryland, and remanded the case. *See supra* note 134.

VI. CONCLUSION

Failure to recognize chances as protected interests wrongfully denies recovery to plaintiffs with a less-than-even chance of sustaining physical harm. To protect these plaintiffs, courts must recognize that chances are protected interests and acknowledge that lost chances and increased risks are compensable injuries. Moreover, such recognition inhibits any judicial inclination to "distort" the traditional preponderance standard for proving proximate cause.

The percentage probability method should be used to calculate damages in chance cases. This method most fairly and accurately measures the value of a chance. Finally, recognition of chances as protected interests would best serve tort deterrence objectives and most equitably allocate resources between tortiously injured plaintiffs and negligent defendants.

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